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Case report

Subsidence of hypertension in a patient with giant hydronephrosis who underwent nephrectomy: A case report and mini-literature review of ureteropelvic junction obstruction

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ABSTRACT

Giant hydronephrosis is a rare diagnosis, especially when it arises from ureteropelvic junction obstruction (UPJO) in adults. Herein, we present a case of giant hydronephrosis in a hypertensive adult who had suffered abdominal fullness for many years. In this case, hydronephrosis with pyonephrosis was accidentally found by ultrasonographic scan. A staged surgical approach with a preoperative percutaneous nephrostomy and nephrectomy was performed. UPJO was confirmed during the operation, and this hypertensive patient unexpectedly became normotensive after the nephrectomy.

1. Introduction

Giant hydronephrosis is a rare diagnosis. It is defined in adults as containing more than 1 L of urine, occupying the hemiabdomen, crossing the midline, or being at least five vertebral bodies long.[1] The most common cause of giant hydronephrosis is a ureteropelvic junction obstruction (UPJO), followed by stones, trauma, and tumors.[2] The etiology of UPJO can be primary or secondary. Primary UPJO is more likely due to an intrinsic abnormality of collagen or muscles,[3] while the causes of secondary UPJO, which is less common, include iatrogenicity, inflammation, or malignancy.[4]

2. Case report

A 58-year-old female patient had hypertension under medical control for 20 years. She had occasionally suffered from flatulence, nausea, and constipation for many years. Recently, she experienced general weakness, a poor appetite, severe nausea, and vomiting. Therefore, she visited a hospital for consultation on February 20, 2010. Abdominal ultrasonography images showed large cystic lesions over the right kidney without visualization of the normal parenchyma; a right polycystic kidney or severe right hydronephrosis was suspected at that time. An abdominal computed tomography (CT) (Fig. 1) scan indicated giant hydronephrosis (34 cm in greatest diameter) with a thin parenchyma that occupied a space over the hemiabdomen and resulted in lateral deviation of the small bowels; however, no definite intestinal obstruction was noted. Because of the giant hydronephrosis without a definite etiology, she was referred to the urology outpatient department at another hospital.

A percutaneous nephrostomy (PCN) was performed, and then 4300 mL of turbid fluid was discharged. Results of the urine cytology report showed negative findings. After insertion of the PCN tube on March 9, 2010 (Fig. 2), another abdominal CT scan was performed which showed marked shrinkage of the right hydronephrosis and repositioning of the small bowels. The average daily urine output from the PCN was around 50 mL.

Because of PCN dislodgment, fever, and right flank pain, she visited our hospital on September 22, 2010. Abdominal CT scan using a contrast showed a right renal multilocular cystic lesion, and differential diagnosis, instead of obstructive uropathy, of a multilocular cystic nephroma or multicystic dysplastic kidney was made.

A right PCN was performed, and 4780 mL of reddish, turbid urine was emitted on September 23. The daily average urine output from the PCN was around 50 mL as before. Initially, a cefazolin dose (1 g

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Fig. 1. Giant hydronephrosis (34 cm in greatest diameter) with a thin parenchyma that caused lateral deviation of the small bowels.

Fig. 2. Marked shrinkage of the right hydronephrosis after insertion of a percutaneous nephrostomy and repositioning of the small bowels.

q8h) was administered intravenously, and as the fever subsided the treatment was shifted to oral administration of cephradine (500 mg 2# t.i.d.). A second urine cytology report still showed negative findings, and the urine culture was sterile. After discussion with the patient and her family, a right nephrectomy was suggested. A right nephrectomy was performed with a flank incision on October 21. During the operation, severe and generalized adhesion of Gerota's fascia and the peritoneum was encountered. An enlarged ($25 \times 12\ cm^2$), sacculated kidney with a very thin parenchyma (Fig. 3) and UPJO was found (Fig. 4). The operative time was 2 hours and 25 minutes. The blood loss was 170 mL. Subsidence of hypertension (systolic blood pressure of ~160–180 mmHg preoperatively and 100–120 mmHg postoperatively) was incidentally noted (Fig. 5). The pathologic diagnosis was chronic pyelonephritis. A microscopic examination revealed diffuse glomerulosclerosis and degeneration of the tubules. The patient was discharged from the hospital on postoperative day 6. The duration of follow-up was 6 months, and during this period the blood pressure remained within a normal range.

3. Discussion

Giant hydronephrosis is a rare diagnosis. Despite advances in morphologic and functional imaging of UPJOs, controversies remain regarding the etiologic and surgical significance of the anatomical relationships of the renal pelvis, ureter, and adjacent vessels.[1] Some of the literature mentions flank pain as the commonest symptom, but recurrent flank pain, which seems to be the best indication for surgery, was not found in our patient.[2,3] A nephrectomy was performed on this patient instead of pyeloplasty which is always performed for a UPJO, because the etiology of the giant hydronephrosis could not be confirmed preoperatively, and the kidney was considered to be nonfunctioning. UPJO was difficult to identify by abdominal enhanced CT scan in this case.

Treatment options for a UPJO include a nephrectomy, dismembered pyeloplasty with or without a nephropexy, a pyelovesicostomy, a ureterocalicostomy, and a calicovesicostomy with or without a Boari flap.[4] Regardless of the option chosen, a staged surgical approach with slow decompression, as in the case of a preoperative PCN, was suggested because of the potential cardiopulmonary collapse that might occur due to a sudden decrease in the intra-abdominal pressure.

With great technical progress in visualization during surgery and equipment handling, there are increasing numbers of successful reports concerning laparoscopic pyeloplasty. However, we chose an open nephrectomy rather than a laparoscopic pyeloplasty because we did not really know about the UPJO preoperatively. Because of the infective nonfunctioning kidney and

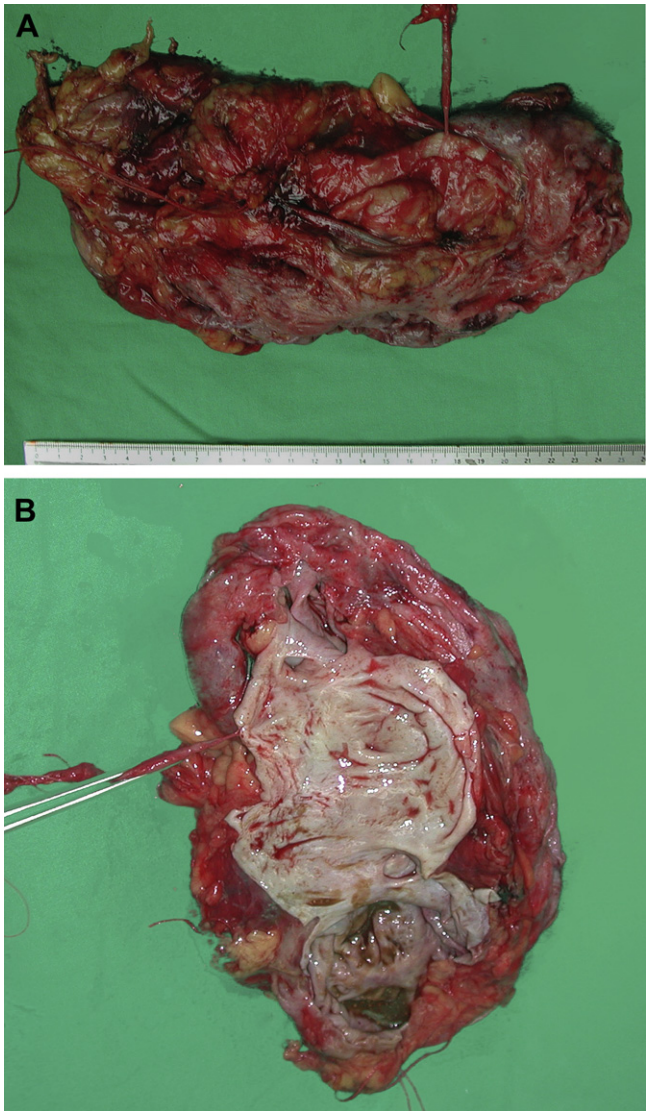

Fig. 3. Enlarged (25 × 12 cm^2) sacculated kidney with a very thin parenchyma.

laparoscopic surgery in this case, and noting the severe and generalized adhesion between Gerota's fascia and the peritoneum, it did not seem feasible in our experience.

In this article, it is also important to mention the relationship between long-term hydronephrosis and hypertension. Our hydronephrotic patient with hypertension for 20 years unexpectedly benefited from the nephrectomy, and such a condition was observed in children in the previous literature.[5,6] Carlström et al concluded that hypertension was proportional to the degree of hydronephrosis, and it was apparently salt sensitive in animal studies.[7] However, there are other studies revealing that a certain proportion of hypertensive children did not benefit from a nephrectomy, and another retrospective study showed that hypertension could be attributed to damage to the contralateral kidney.[8]

Giant hydronephrosis in adults arising from a UPJO is rarer than in children in the documented literature. Few studies have reported the relationship between giant hydronephrosis in adults and hypertension. We present this unusual case to highlight that hydronephrosis, although had existed for a long period, may have played a role in the formation of hypertension. And a nephrectomy may be considered to improve symptoms, infection, and hypertension.

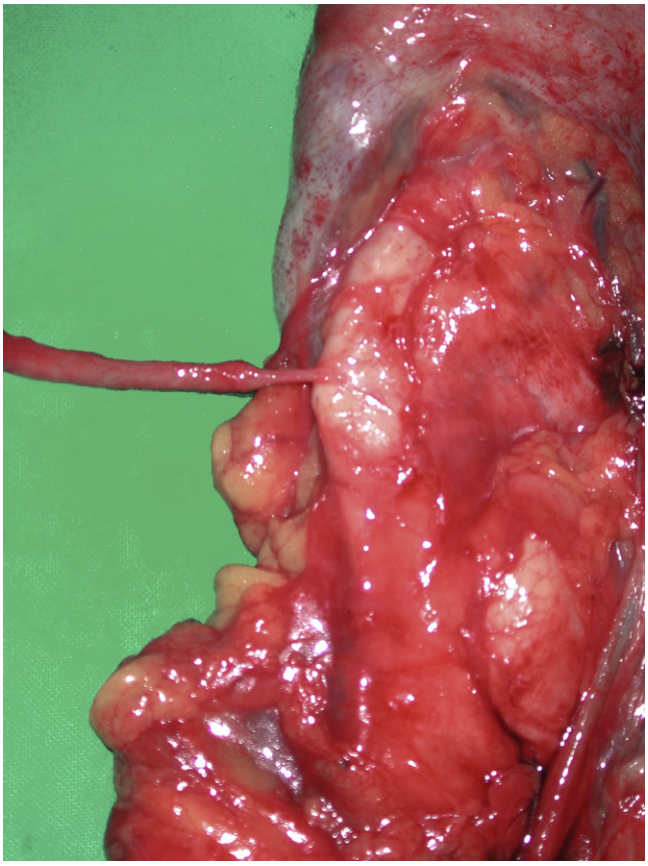

Fig. 4. Portion of the ureteropelvic junction obstruction.

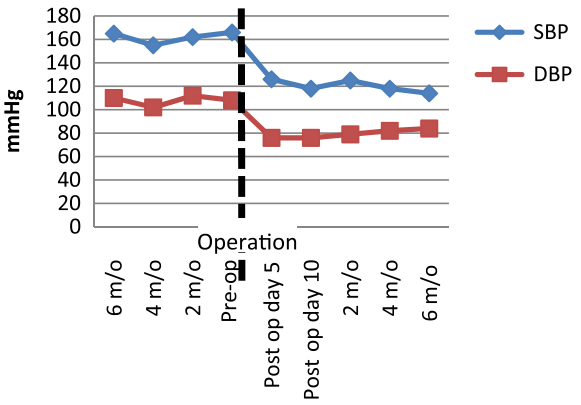

Fig. 5. Changes in blood pressure before and after the operation. This chart shows that the patient was hypertensive before the operation. After the operation, the patient's blood pressure became normal. The duration of follow-up was 6 months. DBP = diastolic blood pressure; SBP = systolic blood pressure.

Conflicts of interest statement

The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in the manuscript.

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